from hairs, while in *Ixia* they are arranged along the edges of the stigmata. It is however to the structure of the stigmata of *Epilobium hirsutum* and *Godetia rubicunda* that I would particularly call attention, conceiving them to confirm in the strongest manner my opinion that the stigmatic function in the Campanulaceæ is not limited to that part which is usually considered to constitute the proper stigma. These are quadripartite, and each division of their true stigmatic surface is covered with hairs precisely resembling those of the Campanulaceæ.

I am about to try an experiment, the issue of which will determine the truth or fallacy of my deductions, as far as the Campanulaceæ are concerned. As each flower of *Campanula pyramidalis* comes into blossom, I intend to cut away the whole of the true stigmatic branches, leaving only the lower portion of the style covered with hairs and pollen. Should perfect seeds ripen upon this plant, the question will, I think, be satisfactorily decided.

August 1841.

XI.—*On some species of European Pines.* By Capt. S. E. Widdrington*, R.N.

In a paper which was read before the British Association at Newcastle (Ann. Nat. Hist., vol. ii. p. 163), the two species of *P. austriaca* and *P. Pumilio* were not fully described, nor their places in the system as to elevation assigned. This deficiency, which was caused by my not having seen these species growing in their natural sites, a recent tour in Austria and Upper Germany has enabled me to supply.

The *Pinus austriaca* of the English, *P. nigrescens* of the German botanists, partly covers, as it no doubt once did entirely, the plain of Austria to the south and east of Vienna. There is an extensive remnant of it between Neustadt and the foot of the Semering range, which divides Austria and Styria. It also partly clothes the hills near Baden; but in ascending the range it soon disappears, and is replaced by the spruce and Scotch firs. I am not aware of its being seen to the north of the localities I have mentioned, nor in the northern prolongation of the range, there called the Wiener Wald. In Styria I never saw it to the north of the river Muhr; but it ranges to the south of Styria, forming a sort of link between the European pine series and that of the Caucasus and of Asia. On considering the elevation and geography of these ha-

* Late Cook. Read in the Section of Zoology and Botany at the meeting of the British Association, Plymouth, and communicated by the Author. See his paper on *Pinus* and *Abies*, Ann. Nat. Hist., vol. iii. p. 296.

bitats, it must undoubtedly be placed in the zone below *P. sylvestris.* At the same time there is no question that it is sufficiently hardy to resist any cold to which it is liable to be exposed in these islands. The thermometer at Vienna fell last winter to 19° of Reaumur, and in 1830 to 22°, or nearly 18° below zero of Fahrenheit, a degree I believe seldom, if ever, seen in Britain, at least in modern times.

This species is very nearly connected with *P. taurica* or *Pallasiana*; the foliage is scarcely to be distinguished; but on comparing the cones of the two species, as grown in the Botanical Garden at Vienna, I was struck with a difference in the form of the scales, and had the satisfaction of being immediately told that the same remark had been made by Mr. Brown, who had examined them. As, however, experience has shown me the mistakes which are made by judging of pines from specimens grown in gardens, and especially in nursery grounds, where the treatment sometimes entirely alters the habit of the tree, I made application for, and was promised by the enlightened director of the botanical department, Mr. Endlicher, cones of both species taken from the natural forests at the proper season, which will probably enable the question of their identity or distinctness to be decided.

From the quick growth of this tree, the great beauty of its foliage, which is long, thick and tangled, and of the deepest green, as well as the great value of the timber, which the Austrian woodmen consider superior to that of *P. sylvestris,* it cannot be too strongly recommended to the attention of planters. It is equally fitted for the forest or the park, for use or for ornament, and its deep tints would form an admirable contrast with the light and transparent foliage of the elegant *Pinus hispanica.* The country is very much indebted to Mr. Lawson of Edinburgh, who first introduced this interesting species, and it cannot be too generally used with the *Laricio,* a congener, as a substitute for the *Pinaster,* which has rather unfortunately been tried in some parts of the West of England, the timber being comparatively valueless, and in every other respect very inferior to the species we are now considering. It cannot be too strongly urged on those who have the care of making fir plantations for future utility, to plant the evergreens, which are to *remain,* at the requisite distances, and to have the fillings-up entirely of larch. By adopting this method several advantages accrue. The woodmen make no mistakes in selecting, during the process of thinning, and no spaces are left too open or too close. The evergreens, which require more or less care when young, are more readily looked after, and their places supplied where necessary, in case of failure. The larch should be planted a year or two before the ever-

greens, by which time the grass is grown, and affords a shelter and protection against the destruction of game, &c. The trifling difference in the shelter between the evergreen and deciduous species is more apparent than real, and is more than compensated by the superior value of the larch thinning and the additional fertility imparted to the soil by the fall of the spiculæ. By having only a definite number of evergreens, the landlord can afford to have better sorts, and expend more care upon the rearing and looking after them.

On Pinus Pumilio.

I have found the difficulty of obtaining information respecting this curious tree so great, that if, from the inspection of the beautiful specimens at Dropmore and in some other collections, I had not been quite satisfied of its being a distinct species, I might have been incredulous, and in the words of the schools, asked, "Quid est Pumilio?" or in the summary mode of writers and compilers who treat on trees they never saw in their natural forests, set it down as a "mountain variety" of some other species. All doubt however on the subject my late tour in Upper Germany has completely enabled me to set aside, and more satisfactorily than I could possibly have anticipated. I first met with it, though sparingly, in Upper Styria. In the Saltzkammergut it is abundant, though high up, and above the Scotch and spruce, which form the mass of the forests in that beautiful region. By far the largest portion was met with in the Bavarian Alps, which it inhabits from the base almost to the summit, and in every sort of ground; an extensive swamp or morass adjoining the Chiemsee, the principal lake of Bavaria, is covered with it, and the effect of its dwarf and even surface a few feet above the ground is curiously contrasted with the lofty forests of spruce and Scotch fir which surround the marsh wherever the ground is sufficiently dry to bear them.

Although it flourishes in this strange locality, where no other fir or scarcely any other tree can exist, marshy ground is by no means its only or favoured habitat. In the neighbouring mountains, where it is extremely abundant, I found it at the base of the chain, in the dry gravelly beds of the torrents, and it gradually creeps up the arid limestone to the very summit of the range which separates Bavaria and the Austrian Tyrol, living above its congeners of the forest and to the very limits of arboreal vegetation. When seen in these situations from below, it could not, by the unpractised eye, be distinguished from furze or gorse.

The peculiar form of this tree consists in its having no

regular leader. Immediately above the ground it divides into a number of smaller stems and branches, which either sweep along the ground, their extremities pointing upwards, or rise at once at an angle of 30° to 45°, according as the neighbours or the locality have permitted it to expand. Very rarely—amongst countless thousands I did not see above one or two examples—one tree makes an attempt to grow straight and throws up a single stem, but the failure of attaining size or elevation shows in these instances the creeping, true habit of the tree. The height attained is rarely above 5 or 6 feet, the diameter of the largest trees being from 20 to 25 feet; though this size is rare, and the appearance is so regular, that in looking over an extensive level planted with it, it is quite as even as the surface of a gorse cover.

The foliage in form and colour resembles that of *P. uncinata*, but the spiculæ are shorter, though standing out in the peculiarly rigid manner of that species. The cones are small, dark-coloured, and differ from both *P. sylvestris* and *P. uncinata*.

From the localities it inhabits it must be placed very high in the series, by the side of *P. Cembra* and *P. uncinata*. I have been the more particular in describing this singular species, in order to guard those who may not have the opportunity of seeing it *in situ* from confounding it, as so many who ought to know better have done, with the stunted individuals of *P. Cembra*, *P. sylvestris* and *P. uncinata*, which are always found at the summit of their respective zones in the high Alps and Pyrenees, and have been called and compiled under the general name of *Pumilio*.

As to the œconomical uses of this tree, it is clear they amount to very little, its wood being only used for inlaying for furniture, such as parts of chairs and the like. To those, however, who possess extensive parks, by planting them fifteen feet apart, and taking care of them during their early growth, they would be curious and useful covers for game.

XII.—*Diagnoses Algarum novarum a cl. Dre. Ferdinand Krauss in Africâ Australi lectarum, auctore Dno.* Hering, Stuttgartiensi*.

Conferva natalensis, Hering. Pilis simplicibus tenuissimis, articulis diametro sesquilongioribus, superioribus æqualibus. *Conferva implexa*, Dillw. proxima. Port Natal.

Dasya tenella, Hg. Fronde continua, tereti, vage ramosa, ramulis bipinnatis, divaricatis.

* Communicated by Mr. Daniel Cooper.